Revamping the Science and Technology Management Career Field

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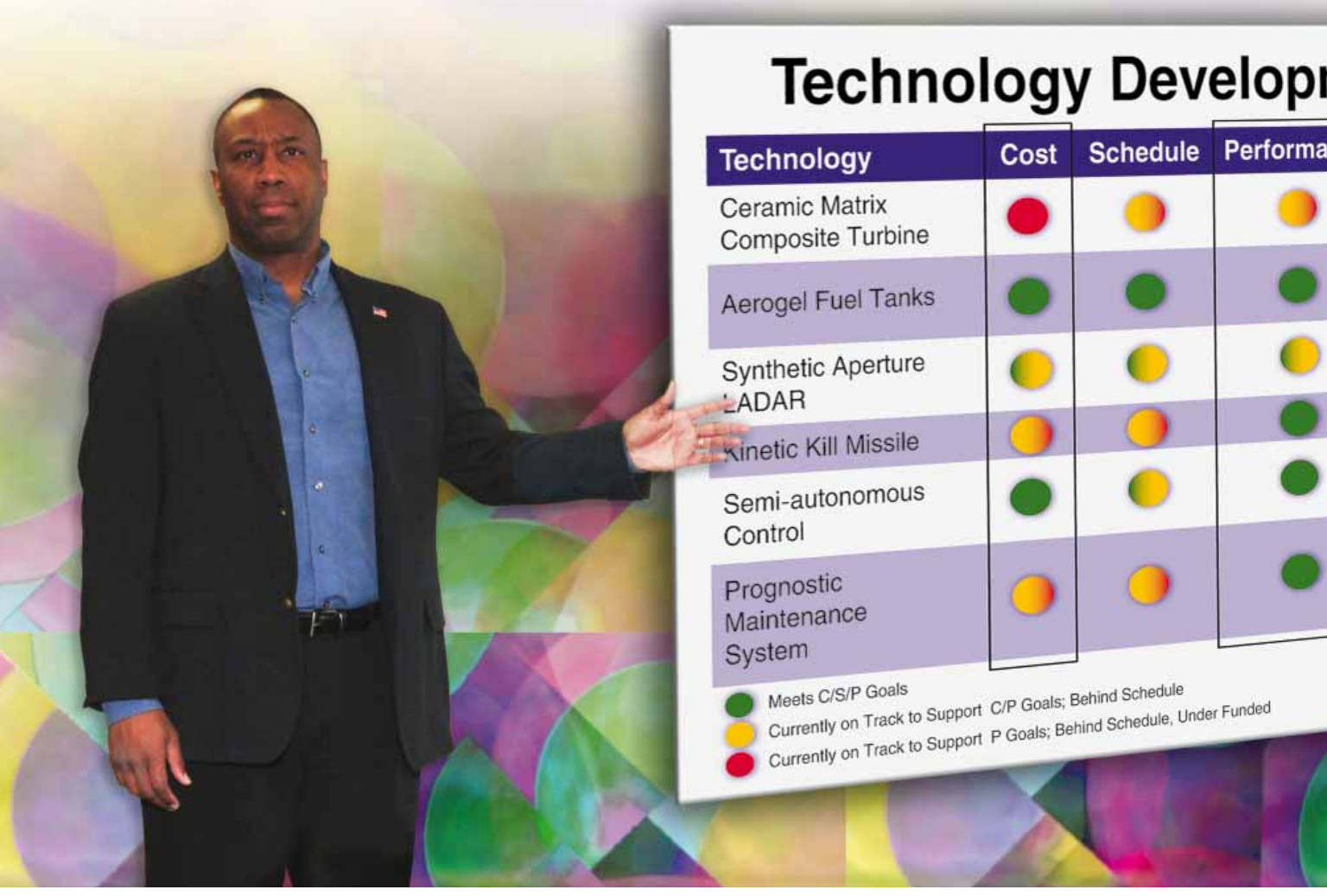

Delivering superior technology to the warfighter effectively and efficiently is crucial to maintaining U.S. military forces' operational advantage. All too often, however, technology has been developed but hasn't transitioned across what is referred to as "the valley of death," which is the gap between developing technology and having it used in acquisition programs of record. The gap between acquisition program managers and technologists results partially from the separate prioritization and management processes involved with both parties. Bridging that gap requires technology managers to obtain a better understanding of the formal DoD acquisition management system and management principles instrumental to transitioning technology. Such an understanding must come from a combination of education, experience, and training. In the past, understanding acquisition management and management principles was difficult to achieve because the science and technology community throughout DoD was not initially recognized as a separate career field in the acquisition workforce. As a result, scientists and engineers

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Army Lt. Col. Robert Dutchie presents an STM 303 team's analysis and management of the project in the student pilot as well as a team's contracting strategy, which shows the contracting strategy, the acquisition program manager's agreed-to exit criteria, and funding issues. STM 303 allows students to discuss and learn about management issues rather than just the technological issues.
DAU Photo by SSgt. Andre Reynolds, USA

frequently did not receive the technology project management training they needed.

A Brief History of the Science and Technology Management Career Field

In 2002, the decision was made to establish a career field for science and technology managers as an addition to the existing acquisition workforce career fields. The objective of the career field, as explained in DoD Directive 5000.52-M, "Defense Acquisition Career Development Program," is to train the DoD science and technology community to better "lead, organize, and/or manage science and technology activities, including basic research, applied research, and/or advanced technology development."

The science and technology management programs are, for the most part, planned and executed by the Services' laboratories; Army Research, Development, and Engineering Centers; Navy Warfare Centers; Air Force Research Laboratory's divisions around the country; and DoD agencies. The Office of the Director of Defense Research and Engineering (DDR&E) has the DoD-wide responsibility to provide overall management and guidance for the defense science and technology programs. That includes responsibility for

leading the science and technology management functional integrated product team, which is responsible for establishing the certification requirements for the Science and Technology Management career field.

When the career field was initially established, there were no level I or level II certification requirements. To obtain level III certification, professionals were required to have two years of science and technology experience and take the level III science and technology management course. In time, a level II certification program was added, and it consisted of taking Fundamentals of Systems Acquisition Management (ACQ 101) and a level II science and technology management course.

By early 2008, there was a growing recognition by the members of the science and technology manager functional integrated project team that it was time to revisit the competencies, training, and certification requirements for science and technology managers. That decision was made as the result of feedback from students and the growing feeling among FIPT members that the requirements were not sufficiently rigorous, especially in comparison to other career fields. The level I requirements were added to allow certification for entry-level people.

"The AT&L team must continue the legacy we have inherited—a legacy of providing unmatched weapons technology that has assured the security and freedom of our nation."

John Young, under secretary of defense for acquisition, technology and logistics

Competencies Revised

Subsequently, in the spring of 2008, the science and technology manager FIPT convened a special workshop with subject matter representatives from DDR&E, military services' science and technology offices, the Defense Threat Reduction Agency, the National Geospatial-Intelligence Agency, and the Defense Advanced Research Projects Agency. The group reviewed and updated the competencies deemed essential for people in the science and technology management career field to succeed in developing, managing, and transitioning technology. The result was a set of 47 competencies in areas such as technology transition, intellectual property, technology security, systems engineering, financial management, program management, and contracting. From that guidance, the Defense Acquisition University developed learning objectives that led to the new course structure and format for the level II and level III courses. The FIPT recommended, and the DDR&E director of plans and programs and the functional leader for the Science and Technology Management career field (Al Shaffer) approved the new competencies, the new course structure, and new certification requirements in June 2008. The goal was to have everything in place by the first quarter of fiscal year 2009.

Courses Revised

The next step was for DAU to develop the two entirely new courses. The Intermediate Science and Technology Management Course (STM 202), which replaced the old intermediate-level course (STM 201), provides a three-day learning environment dealing with the science and technology big picture, external influential organizations, individual Service and agency processes, technical and manufacturing readiness levels, and technology transition agreements spread across exercises and interactive discussion. Half of the STM 201 material was eliminated by relying on added prerequisites to cover the material. Some material, such as systems engineering, was moved from the 300-level course to the STM 201 course.

The heart of the new course is a series of lessons on technical, business, and transition planning and execution. At the start of the course, attendees develop their initial ideas on what they feel are the keys to successful technology transition. By the end of the course, those initial ideas have been discussed and challenged throughout the class, and the final lesson gives the students an opportunity to discuss how their views of the keys to successful technology transition may have changed. Through this intense activity, attendees see how the necessary continuum of science and technology transitioning into acquisition should flow and how to make that happen.

The Advanced Science and Technology Management Course (STM 303), which replaced the old advanced-level course (STM 302), immerses attendees in 3.5 continuous days of self-learning involving three roleplay exercises that provide exposure to the many issues a science and technology manager must address in the initiation, continuous planning, and ultimately, the successful transition of technology to a receiving and approving acquisition program manager.

Through this immersion in the varied project management issues, science and technology personnel work the procedures to more effectively have the technology developed to explicit criteria that the program manager needs to effectively integrate into a larger system. STM 303 differs from its predecessor in that there is very little lecture. Most of the lecture material was moved to STM 202 or is now covered in the added prerequisites.

Both STM 202 and STM 303 were delivered as scheduled. The level II student pilot was held at Fort Detrick, Md., in November 2008, and the level III student pilot was held at Fort Belvoir, Va., in December 2008. Information and schedules for future offerings of the courses are available at <www.dau.mil/schedules/schedule.asp>.

Certification Requirements Expanded

In addition to replacing the existing STM courses with new ones, the certification requirements were revised to require additional training and experience. Science and Technology Management certification now completely achieves three Defense Acquisition Workforce Improvement Act levels, providing fundamental, intermediate, and advanced level of requirements. Level I was added in 2009 to provide a certification opportunity for entry-level people, and the new level ensures professionals obtain a fundamental understanding of the acquisition process and the supporting systems engineering technical processes. Level I training consists of ACQ 101 and Fundamentals of Systems Planning, Research, Development, and Engineering (SYS 101). Level II training was revised and now consists of the online portion of the Intermediate Systems Acquisition Course (ACQ 201A), STM 202, and a continuous learning module on technology readiness assessments. Level III training consists of STM 303 and a continuous learning module on IPT management and leadership. The level III experience requirement was also raised from two years to four years. The requirement to take a continuous learning module titled "Introduction to DoD S&T" will be added for fiscal year 2010, and the module will be available the summer of 2009.

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STM Certification Requirements

Level I
- ACQ 101, Fundamentals of Systems Acquisition Management
- SYS 101, Fundamentals of SPRDE (online)
- CLM, Introduction to S&T (Under development)

Level II
- ACQ 201A, Intermediate Systems Acquisition
- STM 202, Intermediate S&T Management
- CLE 021, Technology Readiness Assessments

Level III
- STM 303, Advanced S&T Management
- CLM 014, IPT Management and Leadership

Science and Technology Management Future

DoD is breaking new ground by raising the bar for certification in the Science and Technology Management career path. Successful completion of the requirements will demand more in-depth training and better preparation by the student before attending in-residence courses. The end result should be a better prepared science and technology workforce able to:

- Conduct technology development and transition planning upfront and continuously through a technology project's life cycle
- Employ improved leadership across DoD science and technology programs
- Steward effective execution and transition of DoD science and technology programs.

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